counted at 6%/yr, were obtained from HRG codes E18–19. Benefits were discounted at 1.5%. Extensive multivariate sensitivity analyses were done. **RESULTS:** In these patients with mean age of 64 yrs, 91% in class III, 23% dead at two yrs, CRT reduced hospitalization for heart failure by 42%, leading to total costs of £3500 per patient vs. £3000 with OPT. Based on 100 replications, mean improvement of 0.16 QALY (SD 0.009) is achieved with CRT at mean net cost of £526 (SD £167) per patient, a mean cost-effectiveness ratio of £3379/QALY. Extensive sensitivity analyses revealed the greatest cost/QALY variability when the length of stay for heart failure was varied ± 25% (£562–£6354). **CONCLUSION:** Despite the cost of implantation, cardiac resynchronization therapy decreases hospitalizations and increases QOL sufficiently to be cost-effective in treating advanced heart failure.

PCV15

POTENTIAL MEDICAL COST OFFSETS OF TREATMENT WITH ISOSRBIDE DINITRATE PLUS HYDRALAZINE IN AFRICAN AMERICANS WITH HEART FAILURE

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OBJECTIVE: Combination therapy with isosorbide dinitrate and hydralazine was recently shown to significantly improve clinical and survival outcomes in African Americans with congestive heart failure (CHF). The objective of this analysis was to measure the potential economic impact of this combination in the US African American population with CHF. **METHODS:** The population of African Americans with heart failure was estimated from US Census Bureau and US NCHS 2002 NHANES data. We then aggregated and compared drug and hospital costs over a 10-month period (the duration of the trial) under a combination therapy scenario vs. a usual-care scenario. Costs were calculated in 2004 USD from the payer perspective. Cost of the generic combination drug regimen (40 mg isosorbide dinitrate and 75 mg hydralazine, three times daily) was calculated using the AWP. The rates of first hospitalizations for treated and untreated patients were drawn from the trial (24.4% of patients without drug combination and 16.4% with drug combination). Hospital costs were estimated based on Medicare reimbursement rates for DRG 127. **RESULTS:** The use of the drug combination resulted in a cost savings of over $270 million dollars for the entire population (n = 800,097), or $338 per person receiving the drug combination. Cost savings with the drug combination were realized over a wide range of clinical and cost parameters and assumptions. **CONCLUSION:** Usage of the isosorbide dinitrate and hydralazine combination in African Americans with heart failure can be expected to generate cost savings in addition to the significant clinical benefits of the drug combination. Further studies of the drug combination over longer time horizons, brand pricing (including pricing for a yet-to-be-approved combination pill), and consideration of other costs such as treatment of adverse events and physician fees will give a more complete picture of the benefits of the drug combination in this population.

PCV16

INCREMENTAL EFFECTS OF CONCURRENT PHARMACOTHERAPEUTIC REGIMENS FOR HEART FAILURE ON HOSPITALIZATIONS AND COSTS

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OBJECTIVE: To evaluate the incremental differences of concurrent and persistent use of angiotensin-converting enzyme (ACE) inhibitors, beta-blockers, loop diuretics, and digoxin on the risk of hospitalization and total costs with heart failure patients enrolled in a managed care organization. **METHODS:** Retrospective database analysis of outpatients diagnosed with heart failure within a managed care organization covering 350,000 lives from January 1, 1997 to December 31, 1999. Linear and logistic regression models were used to examine the association between treatment regimens and all-cause hospitalizations or total direct medical costs after controlling for patient demographics, comorbidities, and other risk factors. **RESULTS:** Of the 1903 patients meeting inclusion and exclusion criteria, 33.2% (n = 615) were observed not to have received any ACE inhibitor, beta-blocker, loop diuretic, digoxin, or angiotensin-receptor blockers (ARB). Subsequent multivariate analyses indicated that the associated risk of one year, all-cause hospitalization was 2.5 times higher ($p < 0.01$) for patients taking none of these medications relative to the overall sample, followed by a 43.6% higher total health care costs ($p < 0.01$). Patients receiving three or more of the specific medications analyzed were associated with significant decreases in risk of one year all-cause hospitalization of approximately 80% ($p < 0.01$) and decreases in total costs of approximately 70% ($p < 0.01$) relative to those utilizing no therapy. **CONCLUSION:** This analysis appears to indicate that a substantial portion of heart failure patients may be receiving suboptimal pharmacotherapeutic care, resulting in a higher associated risk of hospitalization and increase in total health care costs. Conversely, patients that were adherent with concurrent medication therapies were associated with decreases in both hospitalizations and total costs. The implications of this research suggest that quality improvement initiatives seek to identify and manage those not being treated or adherent to established evidence-based care.

PCV17

CAREMARK CAREPATTERNS®HEART FAILURE HOME MONITORING PROGRAM IMPROVES PARTICIPANTS' HOME MONITORING COMPLIANCE

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Caremark has developed an in-home program that monitors weight and symptoms using a telemonitoring device. The device includes a special scale and telephone. A registered nurse monitors for any changes in the participant and further assesses their condition. The goal of this program is to encourage participants to weigh daily to recognize early symptoms and to follow their physician. **OBJECTIVE:** To evaluate the effectiveness of the CarePatterns heart failure home monitoring program. **METHODS:** Participants were selected based on severity, not on dialysis, not in any other monitoring program, not going out of town, and fewer than 320 pounds. The objectives were to get participants to meet selected benchmarks after 60 days. These included daily weight taking, action plan, and when to call their physician, no changes in weight or symptoms in prior 28 days, and fewer than three Non-Compliance alerts in 28 days. **RESULTS:** In total, 100 participants enrolled, 51% male 49% female, mean age of 73. Seventy-seven individuals started daily weight taking. A total of 54, or 71%, of these participants met the graduation requirement. The retention rate for the CarePatterns Heart Failure program was 98% for the enrolled group and 80% for the non-enrolled group $p < 0.05$, 45 participants had an alert, resulting in 16 doctor visits, two emergency room visits and two hospitalizations, 32 participants did not have an alert.

Conversely, these participants had 3-doctor visits, one emergency room visit and two hospitalizations. Ninety-eight percent of the graduated participants reported being satisfied with the program. **CONCLUSIONS:** Enrollment in the CarePatterns Heart Monitoring program successfully trains participants to monitor their weight daily and develop an Action Plan. The monitoring program also increases overall retention and participants report strong satisfaction with the program. These factors all should contribute to lower medical utilization and improved clinical outcomes.

PCV18

USE OF ß-BLOCKERS FOR TREATING HEART FAILURE AMONG THE ELDERLY IN BRITISH COLUMBIA, CANADA, 1993–2001

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Until the mid-1990s, Canadian consensus guidelines identified ß-blocker therapy as being contraindicated for persons with heart failure (HF). Based on placebo-controlled randomized trials and economic evaluations that appeared subsequently, more recent consensus statements reversed that recommendation and advocated widespread use of ß-blockers for moderate to severe HF. **OBJECTIVES:** Our goal was to estimate, among elderly persons discharged after a first HF hospitalization, the extent to which ß-blocker use increased after the reversal in recommendations. **METHODS:** We carried out a retrospective cohort study using a linked administrative database of hospital separations and medication claims. Included were all residents of British Columbia, Canada (BC), aged 65 years and over, sent home after being hospitalized with a principal discharge diagnosis of HF during fiscal years 1990–2001. To eliminate prevalent hospitalizations, we excluded subjects discharged with any diagnosis of HF between 1990 and 1993. The proportion dispensed a ß-blocker within 30 days of discharge was estimated for triennial periods and was modeled using logistic regression. **RESULTS:** For all subjects, the proportion dispensed a ß-blocker after their first hospitalization for HF increased from 2.2% in 1993–95 through 4.0% in 1996–98 to 7.4% in 1998–2001 (crude odds ratio = 3.6; 95% confidence interval 3.3 to 3.9). **CONCLUSIONS:** In this population-based study, we found that in the latter half of the 1990s, there was a three-fold increase in the use of ß-blocker therapy after an initial hospitalization for HF, consistent with new guidelines. However, absolute rates of ß-blocker use remained lower than 10% in BC, indicating that many patients may yet be receiving the benefit.

PCV19

TRENDS IN PHARMACY USE AMONG VETERANS WITH CHRONIC HEART FAILURE (1999–2002)

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OBJECTIVES: To examine patterns of use of drugs for the treatment of chronic heart failure (CHF) and how these patterns change over time. **METHODS:** We identified a national cohort of patients with CHF in the Department of Veterans Affairs (VA) beginning October 1, 1998 (FY99) and obtained their outpatient pharmacy prescription fill records for FY99 through FY02. We tabulated the proportion of patients receiving filled prescriptions for several categories of drugs across years. To adjust for severity of illness and distinguish birth cohort effects from real changes in practice, patients were stratified based on number of years in the cohort. We then compared patterns of use between groups over time. **RESULTS:** The total number of patients ranged from 222,288 in FY99 to 301,485 in FY02. The average age(sd) ranged from 69.7(10.3) to 71.1(10.4). The most prevalent categories in FY99 were angiotensin-converting enzyme (ACE) or angiotensin II inhibitors (65.6%), loop diuretics (64.2%), digitalis glycosides (40.3%), calcium channel blockers (CCB, 37.0%), beta blockers (37.1%) and statins (36.3%). By FY02, digitalis and CCBs decreased to 34.0% and 32.4%, while beta blockers and statins increased to 54.0% and 51.8%, respectively. ACE or angiotensin II inhibitor and loop diuretic use remained relatively constant (69.3% and 62.3%, respectively). Among newly diagnosed patients, 40.6% in FY99 received beta blockers; in FY02, 58.8% were started on beta blockers. Of survivors from FY99, beta blocker use increased to 52.7% by FY02, indicating that 29.8% of surviving patients were added to beta blockers and/or survived longer than patients who were not started on that drug class. Similar patterns were observed within other groups. **CONCLUSIONS:** Pharmacotherapy patterns in the VA changed for patients with CHF from 1999 to 2002, as new evidence emerged from clinical trials. Future work will link these changes in process of care to survival, utilization and cost.

PCV20

DECREASING HOSPITALIZATIONS FOR HEART FAILURE IN BRITISH COLUMBIA, CANADA, 1993–2001

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OBJECTIVE: Heart failure (HF) is a debilitating chronic condition characterized by steady deterioration that is punctuated with acute episodes of decompensation requiring hospitalization. It is among the most costly conditions, consuming between two and 3% of health care budgets in western countries, 2/3 of which is spent on hospitalizations. During the 1980s, increasing age-specific hospitalization rates of HF were observed. However, there is little Canadian information on trends in HF hospitalizations during the 1990s, a period when efficacious therapies for HF, including angiotensin converting enzymes and ß-blockers, were being progressively incorporated into clinical practice. **METHODS:** Using the hospital separations database, we obtained abstracts of all residents of British Columbia, Canada (BC), aged 40 years and over, having a principal discharge diagnosis of HF during fiscal years 1990–2001. To eliminate prevalent hospitalizations, we excluded subjects who were discharged with any diagnosis of HF between 1990 and 1993. Age- and sex-specific, and directly age-standardized, rates of initial HF hospitalization were estimated using population denominators. Poisson regression was used to model changes over time. **RESULTS:** For both women and men, age-standardized rates decreased 37% from 1993 to 2001. Decreases of this magnitude were observed over all ages. **CONCLUSIONS:** In this population-based study, we found that declines in rates of initial hospitalization for HF occurred in BC at the same time that efficacious therapies were incorporated into practice. While this finding is encouraging, alternative explanations such as concurrent hospital downsizing that restricted admission to more severe cases, must be ruled out before concluding that persons with HF were managed better.